

## WHAT IS CLAIMED:

1. A system for producing composite images of real images and computer-generated three-dimensional images comprising:

a real camera configured to generate a series of real images and equipped with one or more sensors to record real camera metadata, at least one of said sensors being adapted to compute positional and orientational coordinates relative to a fixed point;

a metadata alignment device adapted to align said real camera metadata in time, said aligned camera metadata being associated with one image frame via a camera time code to form aligned associated camera metadata;

a computer system adapted to generate a two-dimensional representation of a pre-prepared three-dimensional scene using a virtual camera and further being adapted to receive said aligned associated camera metadata and to calibrate said aligned associated camera metadata against reference tables matching said real camera, said virtual camera being configured and parameterized with virtual camera parameters to simulate said real camera, said virtual camera parameters being controlled in real time, said computer system further being adapted to record calibrated camera metadata and to generate said two-dimensional representation of said pre-prepared three-dimensional scene using virtual camera metadata linked via calibrated camera metadata to the real camera, producing a series of generated images having at least one image quality corresponding with the image quality of the real images.

2. The system of claim 1 wherein said real camera metadata is selected from the group comprising focus information, t-stop information, zoom information, positional coordinates, and orientation coordinates.

3. The system of claim 1 wherein the fixed point is not connected to the real camera.

4. The system of claim 1 wherein calibrating said aligned associated camera metadata comprises calibration for the variation of lens element position of lenses of said real camera varying with zoom and focus.

5. The system of claim 1 wherein said virtual camera parameters are  
5 controlled in real time via said aligned associated camera metadata and said reference tables.

6. The system of claim 1 wherein said at least one optical quantity is selected from the group comprising position, rotation, focus, and depth of field.

7. The system of claim 1 wherein said computer system is adapted to generate  
10 said two-dimensional representation of said three-dimensional scene in response to a key press to time a display of said two-dimensional representation with said real images.

8. The system of claim 6 wherein said computer system is adapted to generate said two-dimensional representation of said three-dimensional scene in response to a key press to time a display of said two-dimensional representation with said real images.

9. The system of claim 1 wherein said computer system is adapted to generate  
15 said two-dimensional representation of said three-dimensional scene in response to a predefined time code.

10. The system of claim 6 wherein said computer system is adapted to generate  
20 said two-dimensional representation of said three-dimensional scene in response to a predefined time code.

11. The system of claim 1 wherein said reference tables contain calibration information for lens distortion, said computer system being additionally configured to distort, via calibrated camera metadata, a generated series of images to at least approximately match with the lens-based distortion of the real images.

12. The system of claim 1 wherein said computer system comprises at least two computers.

13. The system of claim 1 wherein said reference tables comprise user-selectable presets for lenses and filters.